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## MODAL FUNCTION IN ROCK AND HEAVY METAL MUSIC

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Popular-music scholars have long debated the issue of whether analytical tools developed to explain Western European tonal art music are appropriate or not for the analysis of vernacular repertoires.<sup>1</sup> Traditional terminology and methodologies are focused on parameters important to art music and well-represented by its notation, such as formal and pitch-based structures, but they are not well developed for parameters more important to vernacular musics such as rhythm, timbre, and microtonal pitch inflections. I propose that these models can nonetheless be profitably modified to apply to popular musics such as rock and related genres that derive from outside of the tonal art-music tradition.<sup>2</sup> While the syntax of much vernacular music differs on the surface from that of the common-practice tradition, this is not the case with many deeper-level organizing principles, including pitch centricity and hierarchy, relative consonance and dissonance, and phrase structure and function. Time and again throughout the history of theory, complex analytical frameworks developed to understand a particular set of principles in an earlier repertoire have been profitably adapted to address a more recent one. In this instance, I propose that the tripartite model of harmonic function comprising tonic, dominant, and subdominant, developed from the theories of Rameau, Riemann and others, can be expanded to encompass modal, pentatonic, and blues-based pitch structures, and that the relative stability of these harmonic functions is an essential component in defining phrase function. This study investigates the harmonic and phrase functions encountered in Anglophone classic rock and mainstream heavy metal, exploring pitch structures that make up the basic material of a significant body of songs, which do not readily conform to the paradigm of major-minor tonality but that can nonetheless be interpreted in light of traditional tonal constructs.

This essay’s analytical focus on harmonic structures requires comment before proceeding, and adds to the problematic emphasis to date (not confined to popular-music scholarship) on pitch-based analysis, and the comparative lack of attention to other important parameters such as timbre, texture, and sound production, for which analytical tools and methodologies are still being developed. However, the chord pattern is typically the least varied element among different versions of a song, as demonstrated by the ubiquity of chord charts available on the

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<sup>1</sup> For examples of these debates, see Middleton (1990, 104-107), Brackett (1995, 18-21), Moore (2001, 11-18), Walser (2003, 16-27), and Wicke (2003). I consider popular music as a form of vernacular music because in general, it is not taught in formal institutional settings, but rather, is ordinarily learned through recordings or through oral transmission.

<sup>2</sup> Part of the introductory material in this article also appears in Nicole Biamonte, “Triadic Modal and Pentatonic Patterns in Rock Music,” *Music Theory Spectrum* 32/2 (2010): 95-110. However, this article focuses on larger structures than the concise modal progressions explored here, in particular double-plagal progressions involving the  $\flat$ VII, IV, and I chords; Aeolian progressions involving  $\flat$ VI,  $\flat$ VII, and I; and major-triad structures whose roots form a pentatonic collection.

internet, which normally include song lyrics and often guitar tunings and chord shapes but no other information. I am not arguing that pitch necessarily constitutes a compositionally or perceptually domain of popular music, but rather, attempting to justify the essentially formalist orientation of this study and its focus on harmonic patterns.

Harmony in rock has been described by several authors as less directional or less functional than in conventional tonality (see, for example, Stephenson 2002, 113-114; Carter 2005; Björnberg 2007). This is due in part to the prevalence of pentatonic, modal, and blues-based structures, and the corresponding lack of a leading tone in many styles, characteristics deriving from their roots in the blues and the modal-folk revival. Related factors are the tendency of large-scale structures to be cyclic rather than goal-directed, and the textural divergence that Allan Moore and more recently David Temperley have called the ‘melodic-harmonic divorce’ (Moore 1992, 189; Temperley 2007). In many instances, however, the melody and the harmony can be analytically reconciled, either through rhythmic regularization or through an expanded conception of chord tone that encompasses added notes and extensions.

Some commentators have concluded that typical chord movements in rock music are not only different from, but opposite to, those in common-practice tonality. According to the theory of root motions developed by Ken Stephenson, chord progressions in common-practice music normally move by descending fifth or third, or by ascending second, while in contrast, typical chord movements in rock move by ascending fifth or third, or by descending second (Stephenson 2002, 102-4). Progressions by descending fifth and third are perceived as more directional because each subsequent chord root is a new note, which was not part of the previous harmony, whereas progressions by ascending fifth and third (or ‘successions’, which he prefers to ‘retrogressions’) are perceived as less strongly directional because each subsequent chord root was already present in the preceding harmony.

This model, however, does not accurately reflect musical practice. In order to account for the extreme prevalence of progressions by descending fifth and third in compositional practice in rock, and the relative normality of progressions down by second in common-practice art music, we can redefine these root-motion categories as tendencies rather than norms, as in the very similar conception of dominant and subdominant harmonic vectors formulated by Nicolas Meeùs in several studies focused on modal and tonal art music (Meeùs 2000 and 2003; Meeùs et al. 2008). These vectors consist of the same intervallic movements described by Stephenson, correlated with implied harmonic functions: dominant vectors normatively move by descending fifth, which may be substituted by descending third or ascending second, while subdominant vectors normatively move up by fifth, and may be substituted by ascending third or descending second. According to Meeùs, tonal music shows a strong preference for dominant vectors, while modal music is characterized by both types of vectors. This assertion has been confirmed to some extent by work done by Dmitri Tymoczko on common-practice repertoire (Tymoczko 2003), and it seems to be an apt descriptor of the behaviors of tonal and modal idioms in rock music as well.

In addition to the root-motion theory described above, several other interpretive paradigms for pitch relations in rock music have been explored: harmonic function (Doll 2007), scale-degree theory (Moore 1992 and 1995), Schenkerian models,<sup>3</sup> and transformational theory.<sup>4</sup> Among

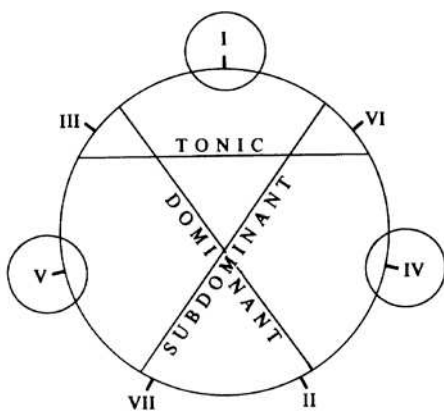
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<sup>3</sup> Schenkerian techniques presume a concern for voice-leading and counterpoint which is often absent from the harmonic layer in rock music, especially when it is iterated by rhythm guitar rather than keyboard. See Moore 2001, 59-60, for a discussion of the differences between keyboard-based and guitar-based compositional harmony and voice-leading.

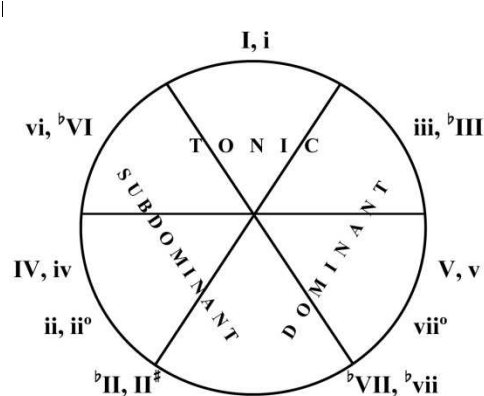
these, the broader categorization of scale degrees into the three conventional harmonic functions of stable tonic, less stable subdominant, and unstable dominant seems to be the most useful for generalizing about chord patterns. In many cases, chord hierarchy and function is established by the tonal context and the surrounding harmonies, and clarified by other musical parameters such as rhythm, hypermeter, phrase structure, texture, consonance, and melodic or harmonic contour. Three phrase types are considered in the analytical discussion below: (1) open phrases, which depart from an initial tonic and end on a comparatively unstable chord, (2) closed phrases, which begin on an unstable non-tonic harmony and resolve to tonic, and (3) circular phrases, which begin and end on tonic. I have not included a category for phrases that neither begin nor end on the tonic, since they are comparatively rare in this repertoire and typically occur only in transitional sections such as prechoruses and bridges.

Eytan Agmon has categorized the diatonic triads on the basis of their common tones and their positions relative to the tonic, generating a diatonic-third cycle, as shown in Ex. 1a (Agmon 1995, 201). The functions of tonic, dominant and subdominant are mapped onto three overlapping semicircles; the prototype for each category is the encircled primary triad. The remaining triads each participate in two function categories: III as tonic or dominant and VI as tonic or subdominant, which are familiar ideas from Riemann's *Vereinfachte Harmonielehre*, and VII and II as dominant or subdominant, which have precedents in Daniel Harrison's theory of harmonic function, as each contains both dominant- and subdominant-functioning scale degrees (Harrison 1994). In practice, non-primary triads might express either one of their two potential functions, or aspects of both. Agmon's examples of dominant-functioning supertonic are not convincing—most analysts would probably label them neighbor chords—and no example of a subdominant-functioning leading-tone triad is given. However, if the subtonic triad is incorporated into the model, as in Ex. 1b, its dual potential function as dominant or subdominant, common in rock music, is neatly explained (this point will be discussed further below). This model also explains the roles of  $\flat$ II as both a subdominant-functioning Neapolitan and a dominant-functioning tritone substitute, as well as the similar dual roles of Lydian II $\sharp$  as chromatically altered subdominant and, less commonly, of a dominant substitute.

Ex. 1a: Harmonic Functions of Tonal Triads



Ex. 1b: Harmonic Functions of Modal Triads



<sup>4</sup> Neo-Riemannian transformations have the greatest explanatory power in post-1990 alternative genres, which are rich in chromatic thirds and other cross-relations; see Capuzzo 2004. Koozin (2011) presents a transformational model of guitar-chord voicings.

In Ex. 1b, I have expanded the model to include these diatonic modal triads, and adjusted the notation to reflect triad qualities. I have also reversed the positions of the dominant and subdominant regions to align with the traditional flat and sharp sides of the circle of fifths. Tonic harmonies contain scale degree 1 and/or some form of 3, subdominants contain forms of scale degree 4 and/or 6, the adjacencies above and below the dominant degree 5, and dominants contain forms of scale degree 7 and/or 2, the adjacencies above and below the tonic degree 1. Christopher Doll has remarked that in major and minor pentatonic systems, where the two sizes of scale step are major second and minor third, the adjacencies above and below the tonic that suggest dominant function could also be  $b3$  or  $6$  (Doll 2007, 23-24); similarly, the adjacencies surrounding the dominant are  $3$  and  $b7$ .

Despite the focus of this study, a large percentage of pop and rock music is conventionally tonal, particularly that from the 1950s and 60s (Everett 2004, §7) and particularly in pop-oriented genres, which have a stronger tendency than rock-oriented genres to follow classical models of voice-leading. Since the diatonic major system is both a statistical and historical norm, the Roman numerals in my examples are shown in relation to major. A valid criticism of this notation is that it symbolizes the flat-side triads  $bIII$ ,  $bVI$ , and  $bVII$  as nondiatonic, although in the repertoire under consideration, these chords are at least as normative as their diatonic counterparts—in the case of  $bVII$ , significantly more so. I have adopted this notation nonetheless because it is widely used and requires minimal explanation. In the following examples, an arabic numeral with superscript 5 indicates a power chord: an open fifth or fourth, often doubled at the octave. Subsidiary passing or neighboring harmonies are shown in parentheses.

## Ex. 2: Modal Progressions with Conventional Tonal Functions

<u>artist, title (year), section</u>	<u>mode</u>	<u>progression</u>	<u>function</u>
The Doors, “The End” (1967), verse	mixolydian	$1^5-bVII-1^5   bVII-IV-1^5$	T-D-T   D-S-T
Steppenwolf, “Born to be Wild” (1968), chorus	mixolydian	$I-bVII$	T-D
J.J. Cale, “Cocaine” (1976), verse	mixolydian	$I-bVII$	T-D
Grateful Dead, “Fire on the Mountain” (1978)	mixolydian	$I-bVII$	T-D
The Doors, “Break on Through” (1967)	aeolian	$i-bVII$	T-D
Deep Purple, “Child in Time” (1970)	aeolian	$(bVII)-i   (bVI)-bVII$	(D)-T   (S)-D
Black Sabbath, “Paranoid” (1971), verse	aeolian	$1^5-b7^5-(b3^5-7^5)-1^5$	T-D-(S-D)-T
R.E.M., “The One I Love” (1987) A section	aeolian	$i^7-bVII^{sus2}-i^7$	T-D-T
Santana, “Evil Ways” (1969)	dorian	$i-IV$	T-S
The Doors, “Riders on the Storm” (1971), main riff	dorian	$i-IV_4^6-i^7-IV_4^6$	T-S-(T)-S
Styx, “Renegade” (1978), verse	dorian	$i^7-IV_4^6$	T-S
Pink Floyd, “Another Brick in the Wall” (1979), verse	dorian	$i-IV$	T-S
Grateful Dead, “Brokedown Palace” (1970), refrain	(lydian)	$I-III^\sharp-IV-I-II^\sharp$	T-D-S-T-D

Iron Maiden, “Remember Tomorrow” (1980), verse	phrygian	$i-\flat II-i-\flat VII$	T-S-T-D
Alice in Chains, “Would?” (1992), verse	phrygian	$1^5-\flat II-(\flat vii)$	T-S-(D)
Tool, “Sober” (1993), chorus	phrygian	$1^5-\flat 2^5$	T-S
Megadeth, “The Killing Road” (1994), verse	phrygian	$1^5-\flat 2^5-(\flat VI)-V$	T-S-(S)-D
Black Sabbath, “Symptom of the Universe”			
(1975), intro. & verse	(locrian)	$1^5-\flat 5^5$	T-D
Rush, “YYZ” (1981), intro.	locrian	$1-\flat 5$	T-D
Metallica, “...And Justice for All” (1988), verse	locrian	$1^5-\flat 2^5   1^5-(\flat 5^5)-4^5$	T-S   T-S
Judas Priest, “Painkiller” (1990), verse	locrian	$1-\flat 5^5$	T-D

Example 2 provides a selection of songs that exemplify simple characteristic progressions in each mode and identifies their tonal functions. In the first two categories of Ex. 2, mixolydian and aeolian, the subtonic typically carries dominant function, but also embodies subdominant aspects, as reflected in Ex. 1b. The replacement of the leading tone with the subtonic, and the neighboring position of the chord root, creates a less directional progression than the tonal V-I.

Ex. 3: The Doors, “The End,” basic pattern of verse

In the first mixolydian example, The Doors’ “The End,” the role of the subtonic in its initial oscillation with the tonic is not immediately clear. Ex. 3 provides a lead sheet of the basic pitch and rhythmic material of the verse melody, omitting the first phrase, which repeats. The tonic harmony supporting the voice is a modally ambiguous open fifth, while the instrumental riffs (not shown) use both the minor and major thirds. Since the major third predominates, particularly at the end of the song, I have interpreted the governing mode as mixolydian rather than dorian. The subtonic harmony acts initially as a non-tonic neighbor chord whose function might be either dominant or subdominant. As the phrase is developed, a IV chord is interposed between subtonic and tonic, forming a closed double-plagal progression ending on the tonic:  $\flat VII-IV-I$ . At the most local level, considering only the first two chords,  $\flat VII$  functions as IV/IV, but in the larger context of the phrase it expresses dominant function, in a modal version of the blues cadence V-IV-I. The IV chord occupies the metrically weak half of the bar, just as IV in the blues cadence normally occurs in the hypermetrically weak tenth bar of a 12-bar pattern. Since the IV chord at this point is in first inversion—which is comparatively rare in rock music in general, and also in the Doors’ music specifically—the  $\flat 7-6-8$  contour of the bass line has the same contour as the typical 5-4-8 bass line of the blues cadence.

The dominant function of  $\flat VII$  in the chorus of Steppenwolf’s “Born to Be Wild” is similarly clarified by the use of IV in the verse. (The verse also uses  $\flat III$ ; thus the song as a whole is actually a triadic pentatonic subset, I  $\flat III$  IV  $\flat VII$ , rather than a mixolydian system. However, the chorus by itself comprises a mixolydian I- $\flat VII$  oscillation). In “Cocaine,” written and first

recorded by J. J. Cale but made famous by Eric Clapton, the dominant quality of  $\flat$ VII in the verse is superseded by that of V in the refrain. The harmonic functions in the descending-tetrachord pattern of the refrain, I– $\flat$ VII– $\flat$ VI–V, can be interpreted as tonic–weak dominant–subdominant–strong dominant. The Grateful Dead’s “Fire on the Mountain” has no other harmonies apart from I and  $\flat$ VII, so the function of the subtonic is never clarified beyond non-tonic. This is also the case with the first aeolian example, The Doors’ “Break on Through.”

Just as  $\flat$ VII can take on dominant function in the presence of a clear subdominant, it can take on subdominant function when juxtaposed against a clear dominant. In The Who’s “Won’t Get Fooled Again” (Ex. 4),  $\flat$ VII occurs in the verse as part of an open double-plagal progression. The plagal function of  $\flat$ VII is expressed most strongly in the turnaround bar (the eighth and final bar of the verse), since earlier in the verse the  $\flat$ VII chord is often omitted and is never supplied with a bass note. The repeated movement from I to IV sets up an arrival on the dominant V at the end of each phrase. The first part of the chorus (‘tip my hat’), marked by the entrance of backing vocals and a change in the cymbal pattern, reiterates an answering closed plagal progression, IV–I. The second part of the chorus (‘pick up my guitar and play’) returns to  $\flat$ VII, which twice functions as a dominant preparation that moves to V.<sup>5</sup> The third time, the expected dominant is replaced with IV, and the chorus concludes with an extended plagal cadence, ornamented with neighboring subtonic chords. Thus over the course of the verse-chorus strophe,  $\flat$ VII takes on almost all of its possible functions: as passing chord, double-plagal substitute dominant, dominant preparation, and neighboring subdominant.

Ex. 4: The Who, “Won’t Get Fooled Again,” chord chart of verse and chorus

<b>verse</b>	:	A		(G) D		A		(G) D						
		I		( $\flat$ VII) IV		I		( $\flat$ VII) IV						
			A		A		E		D G :					
			I		I		V		IV $\flat$ VII					
<b>chorus</b>			D A		D A		D A		D A		D A			
			IV I		IV I		IV I		IV I		IV I			
			G		E		G		E					
			$\flat$ VII		V		$\flat$ VII		V					
			G		D (G)		D (G)		D <sup>7</sup>		D		A	
			$\flat$ VII		IV ( $\flat$ VII)		IV ( $\flat$ VII)		IV <sup>7</sup>		IV		I	

In the aeolian mode, the harmonic functions of S–D–T are commonly expressed by the parallel-chord progression  $\flat$ VI– $\flat$ VII–i or  $\flat$ VI– $\flat$ VII–I. In this context,  $\flat$ VI and  $\flat$ VII can be interpreted as upper-third substitutions for IV and V, and indeed they may also function as IV and V in the key of the relative major ( $\flat$ III), just as  $\flat$ III often serves as an alternate tonic in

<sup>5</sup> Philip Tagg refers to the cadential  $\flat$ VII–V as a characteristically Mixolydian ‘cowboy half cadence’, typical enough of soundtracks for Westerns to be parodied in Mel Brooks’ *Blazing Saddles*. See Tagg, ‘Tagg’s Harmony Handout’, 16-17, at <http://www.tagg.org/articles/xpdfs/harmonyhandout.pdf>.

minor modes. In the verse of R.E.M.'s "The One I Love" (Ex. 5), the first repeated phrase comprises a T–D–T oscillation between tonic and subtonic. The  $\flat$ VII chord occupies the same position (the hypermetrically weak second bar) in the third phrase, but  $\flat$ III– $\flat$ VII– $\flat$ VI is most readily interpreted as I–V–IV, briefly tonicizing the relative major. The shift of local tonic is clarified in both phrases by a tonic pedal held throughout: first E, then G. Thus the function of  $\flat$ VII is dominant in both instances, but in relation to different tonics.

Ex. 5: R.E.M., "The One I Love," chord chart of verse

<b>verse</b>		<b>  :</b>	<b>Em</b>	<b> </b>	<b>Dsus2</b>	<b> </b>	<b>Em</b>	<b> </b>	<b>Em</b>	<b>:  </b>
			<i>i</i>		$\flat$ VII		<i>i</i>		<i>i</i>	
			<b>G</b>		<b>Dsus4</b>		<b>C</b>		<b>C</b>	
			$\flat$ III		$\flat$ VII		$\flat$ VI		$\flat$ VI	
(in G:			I		V		IV		IV)	
			<b>Em</b>		<b>Dsus2</b>		<b>Em</b>		<b>Em</b>	
			<i>i</i>		$\flat$ VII		<i>i</i>		<i>i</i>	

The main riff of Deep Purple's "Child in Time" (Ex. 6), in contrast, is firmly rooted in the home key. The underlying progression of long-held, metrically accented harmonies is  $i$ – $\flat$ VII– $i$ , expressing T–D–T, with each of these chords approached via the chord below. On the surface level,  $\flat$ VII– $i$  across each bar line represents a local D–T progression, and  $\flat$ VI– $\flat$ VII represents S–D. The prolongation of scale degrees 5, 3, and 1 in the melody throughout the song (both in the organ and vocal parts) emphasizes the comparative instability of  $\flat$ VII in the third bar of the progression, as the notes of the tonic triad become dissonant against it.

Ex. 6: Deep Purple, "Child in Time," main riff

G
Am
G
Am
F
G
Am

$\flat$ VII
*i*
 $\flat$ VII
*i*
 $\flat$ VI
 $\flat$ VII
*i*

Alternation between tonic–subtonic–tonic, voiced as the power chords  $1^5$ – $\flat 7^5$ – $1^5$ , is also the underlying progression of the verse of Black Sabbath's "Paranoid," and the subtonic is similarly ornamented with a subdominant-functioning harmony. In this instance, the elaborating harmony is  $\flat 3^5$ , which stands in a plagal relationship to the subtonic. The aeolian mode is expressed more strongly in the brief instrumental bridge between the first two verses, which repeats the aeolian progression  $i$ – $\flat$ VI– $\flat$ VII– $i$ , a circular progression that begins and ends on tonic.

In rock music in the dorian mode, major IV often serves its typical tonal function of a plagal upper-neighbor chord to the tonic, as in Santana’s “Evil Ways” and many other Santana songs,<sup>6</sup> or on a larger time scale, the verse of Pink Floyd’s “The Wall.” In the verses of The Doors’ “Riders on the Storm” and Styx’s “Renegade,” IV is a passing harmony between i and i<sup>7</sup>, over tonic pedal. In all of these examples, IV serves as an elaboration of the tonic, followed by a cadential dominant at the end of the verse: V<sup>7</sup> in “Evil Ways,” aeolian  $\flat$ VII– $\flat$ VI–i (D–S–T) in “Riders on the Storm,” a minor dominant in “Renegade,” and a plagal subtonic cadence  $\flat$ III– $\flat$ VII–i (S–D–T) in the “The Wall,” with  $\flat$ III functioning at the local level as IV/ $\flat$ VII, as it does in “Paranoid.”

The mixolydian, aeolian, and dorian modes are fairly common in rock and metal, as they have a long tradition of folk-music harmonizations and are the closest modes to major and minor. In contrast, the Lydian mode is rare in rock and metal—as it has always been in art music—and is usually expressed as an inflection of the supertonic, rather than a diatonic modality. In the Grateful Dead’s gospel-tinged “Brokedown Palace” (Ex. 7), the progression in the first half of the refrain ends on a major II $\sharp$  chord, which occupies the normal position of a dominant. There is no V chord in the body of the song; all of the cadences are plagal. I hear II $\sharp$  as a substitute dominant that offers the wrong leading tone, to scale degree 5 instead of 1, creating a Lydian inflection. A similar interpretation can be applied to the II $\sharp$  chord in the last phrase, as a substitute for the dominant in a more rock-normative I–V–IV–I progression. This altered chord creates a chromatic inner-voice descent, C–B–B<sup>b</sup>–A (mm. 5-8) that answers the chromatic inner-voice ascent at the beginning of the refrain, C–C $\sharp$ –D (mm. 1-3).

Ex. 7: Grateful Dead, ‘Brokedown Palace’, chord chart of refrain

<b>refrain</b>		<b>F</b> I		<b>A</b> V/vi		<b>B<sup>b</sup></b> IV (VI/vi)		<b>F G</b> I II	
		<b>F</b> I		<b>G</b> II		<b>B<sup>b</sup></b> IV		<b>F</b> I	

The phrygian  $\flat$ II chord is also rare in rock practice, probably because it is more affectively marked than the aeolian, mixolydian, and dorian modes. It has a long history of representing pain and lament, and is coded as exotic in a tonal context because of its associations with Andalusian and Arab musics. The phrygian mode is quite common in heavy metal, however, where it is generally not coded as exotic, with a few exceptions such as Iron Maiden’s “Powerslave” and Metallica’s “Wherever I May Roam.”

The function of  $\flat$ II is primarily subdominant, because of the presence of scale degrees 4 and 6, but it also has aspects of dominant function, since scale degree  $\flat$ 2 acts as an upper leading tone to the tonic. In most of the phrygian songs listed in Ex. 2, the subdominant function of  $\flat$ II is clarified by the move to a more strongly dominant harmony at the end of the phrase:  $\flat$ VII in the verse of Iron Maiden’s “Remember Tomorrow” (Ex. 8),  $\flat$ vii in the verse of Alice in Chains’

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<sup>6</sup> Other examples of Santana songs in the Dorian mode that feature i–IV progressions are “Soul Sacrifice,” “No One To Depend On,” and his covers of Tito Puente’s “Oye Como Va” and The Zombies’ “She’s Not There.”



“Would?,” and V in the verse of Megadeth’s “The Killing Road.” Although the chorus of Tool’s “Sober” contains only power chords on 1 and  $b2$ , a pattern very similar to the other examples is used over a tonic pedal in the second half of the verse:  $1^5-b7^5-b2^5-b7^5$ .

Ex. 8: Iron Maiden, “Remember Tomorrow,” guitar part of verse

Like the phrygian mode, the locrian mode is fairly common in metal, and scale degree  $b2$  likewise often acts as an upper leading tone to 1. Scale degree  $b5$  often serves analogously as an upper leading tone to 4, as in the verse of Metallica’s “...And Justice for All” (Ex. 9). In contrast, when juxtaposed directly against the tonic, scale degree  $b5$  typically functions as an altered dominant, as in the verse riff of Black Sabbath’s “Symptom of the Universe” (Ex. 10), the introduction and coda of Rush’s “YYZ,” and the verse riff of Judas Priest’s “Painkiller.” In “Symptom of the Universe,” the inversion of the tonic power chord at the end of the third bar highlights the cross-relation between 5 and  $b5$ .

Ex. 9: Metallica, “...And Justice For All,” verse riff

Ex. 10: Black Sabbath, “Symptom of the Universe,” verse riff

The positions of phrygian and locrian as the flatmost modes of major, as well as their semitones and tritone above the tonic, serve in these songs to enhance the characteristically dark affect of heavy metal. In the melody, scale degrees  $b2$  and  $b5$  function as upper leading tones; harmonically, they function as opposing poles to the tonic because of their tonal distance from it. Such functionality is unprecedented for the locrian mode, which was dismissed by early theorists of the modes as unusable.<sup>7</sup> Modality in general, and minor modes in particular, are far more

<sup>7</sup> Glarean and Zarlino rejected the locrian mode because of its tritone above the final. See Glarean (1547), Bk. II, Chs. 5 and 18, and Zarlino, *Le Istitutioni harmoniche* (1558), Pt. 4, Ch. 11.

prevalent in metal than in most other genres. Like the overwhelming preference for minor in rap music, the preference for minor keys and flat-side modes in heavy metal may be a tonal reflection of the societal marginalization of these subcultures.

Although I have presented here only a small sampling of songs—and at that, only those with harmonic structures simple enough to be reducible to a few chords—the modal systems they illustrate represent the basis of a significant body of rock and metal, and are a fundamental component of the harmonic and melodic syntax of these genres. In many instances chord hierarchies are clearly established through combinations of meter, duration, texture, consonance, and contour, expressing many of the same harmonic and phrase functions that have been identified in tonal musics. I hope that my assimilation and expansion of some existing theoretical models contributes to a much-needed clearer understanding of modal syntax and function in rock and heavy metal music.

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The Locrian mode has been used in modern jazz since the end of the 1950s, but only as a melodic construct with no independent functionality: it is the scale normally used as a basis for improvising above a half-diminished seventh chord, or minor seventh chord with flatted 5th.

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